Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Turkey Creek

Water Body Segment at a Glance:

County: Jasper
Nearby Cities: Joplin
Water Body IDs: 3216 and 3217
Length of impaired segments: 7 and 5 miles
Pollutant: Bacteria
Source: Rural Nonpoint Source


State Map Showing Location of Watershed

Note: See also Center-Turkey Creek Information Sheet for metal pollutants

Scheduled for TMDL development: 2013

Description of the Problem

Designated beneficial uses of Turkey Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health (Fish Consumption)
- Whole Body Contact Recreation (WBID 3217– Category A; WBID 3216 - Category B)

Use that is impaired

- Whole Body Contact Recreation

Standards that apply

- Missouri's Water Quality Standards at 10 CSR 20-7.031(4)(C) state that the *E.coli* bacteria count shall not exceed 126 colonies per 100 milliliters of water (126 col/100 mL) for Category A and 206 col/100 mL for Category B waters. This count is the geometric mean during the recreational season (April 1- October 31) in waters designated for whole body contact recreation.

Background information and water quality data

Turkey Creek lies north of Joplin in western Missouri and flows west to join the Spring River just over the state line in Kansas. While the headwaters of this creek rise in the country, it flows through the center of Joplin. Therefore, though not noted on the 303(d) List, the sources of bacteria are from urban as well as rural nonpoint sources. The last six miles or so in Missouri flow through a rural landscape again. For whole body contact recreation waters, Category A means there are

swimming areas which are open to and fully accessible by the public. Category B waters have places deep enough for total immersion (i.e., swimming), but they may be on private lands or inaccessible to the public.

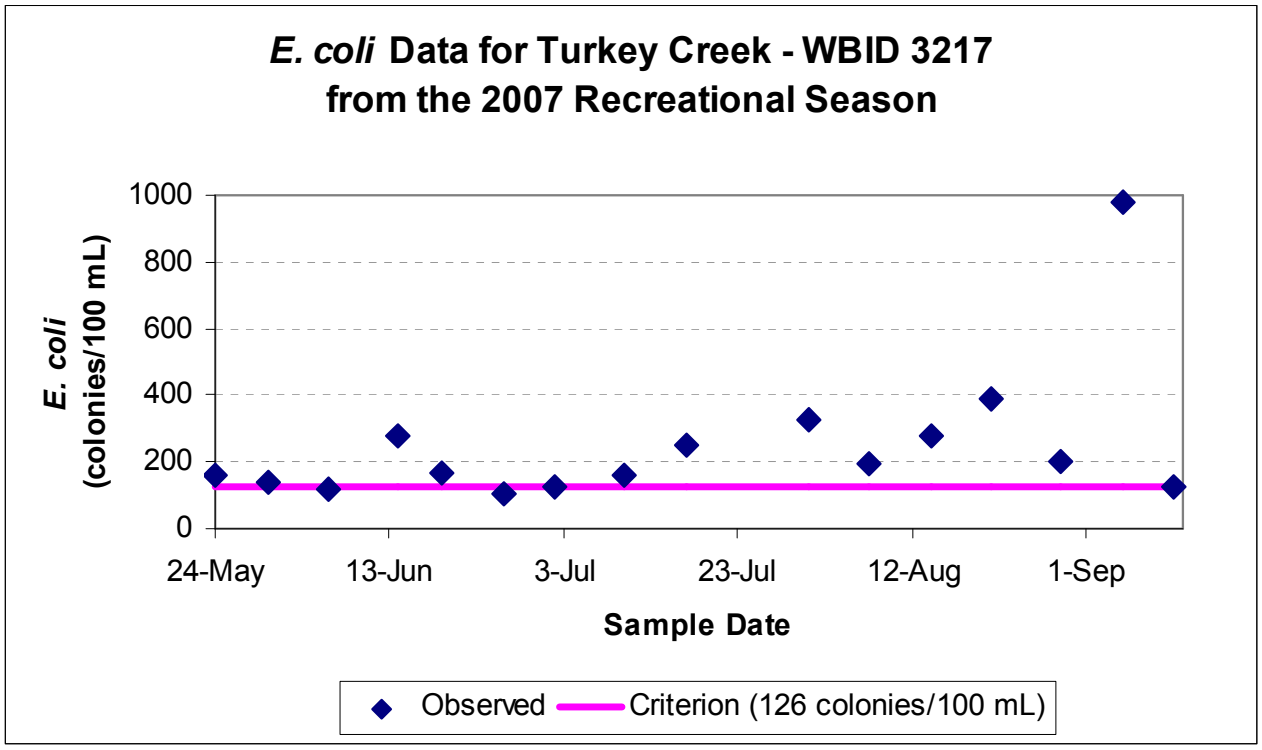
For *E. coli* bacteria, a water body is judged to be unimpaired if the geometric means for all of the last three years for which data is available are less than the appropriate water quality standard. At least five samples must be available from a given recreational season for that season to be considered. The bacteria impairment in the upper Turkey Creek (WBID 3217) is based on water quality data gathered by the Jasper County Health Department in 2007 (Figure 1) at Site 4 (see map on last page). In this figure, the individual data points gathered in 2007 are shown. The geometric mean of these data (206 col/100 mL) exceeded 126 col/100 mL, the water quality criterion for Category A waters. In WBID 3216, basically downstream of Hwy 43, three sites were monitored. The USGS gathered data from 2002-2008, the KDHE in 2006 and the JCHD in 2007. The water quality criterion of 206 col/100 mL for Category B waters was exceeded in several years, 2006, 2007 and 2008 being the most recent (Figure 2). In this figure, the points represent the geometric mean of all of the qualifying data collected in that year.

Excessive amounts of fecal bacteria in surface water used for recreation are an indication of an increased risk of pathogen-induced illness to humans. Infections due to pathogen-contaminated waters include gastrointestinal, respiratory, eye, ear, nose, throat and skin diseases. *E. coli*, are bacteria found in the intestines of warm blooded animals and are used as indicators of the risk of waterborne disease from pathogenic (disease causing) bacteria or viruses. Most *E. coli* strains are harmless, but some can cause serious illness in humans and are occasionally responsible for product recalls. The harmless strains are part of the normal flora of the intestines, and can benefit their hosts by preventing the establishment of pathogenic bacteria within the intestine[1,2]. Missouri's bacteria criteria are based on specific levels of risk of acute gastrointestinal illness. The levels of risk correlating to these criteria are no more than eight illnesses per 1,000 swimmers in fresh water.

People can protect themselves from waterborne illness by avoiding contact with contaminated water. However, when swimming anywhere, it is wise to take common sense precautions. These include washing hands before eating, showering after swimming and avoiding exposure to questionable water if you have open cuts or wounds.

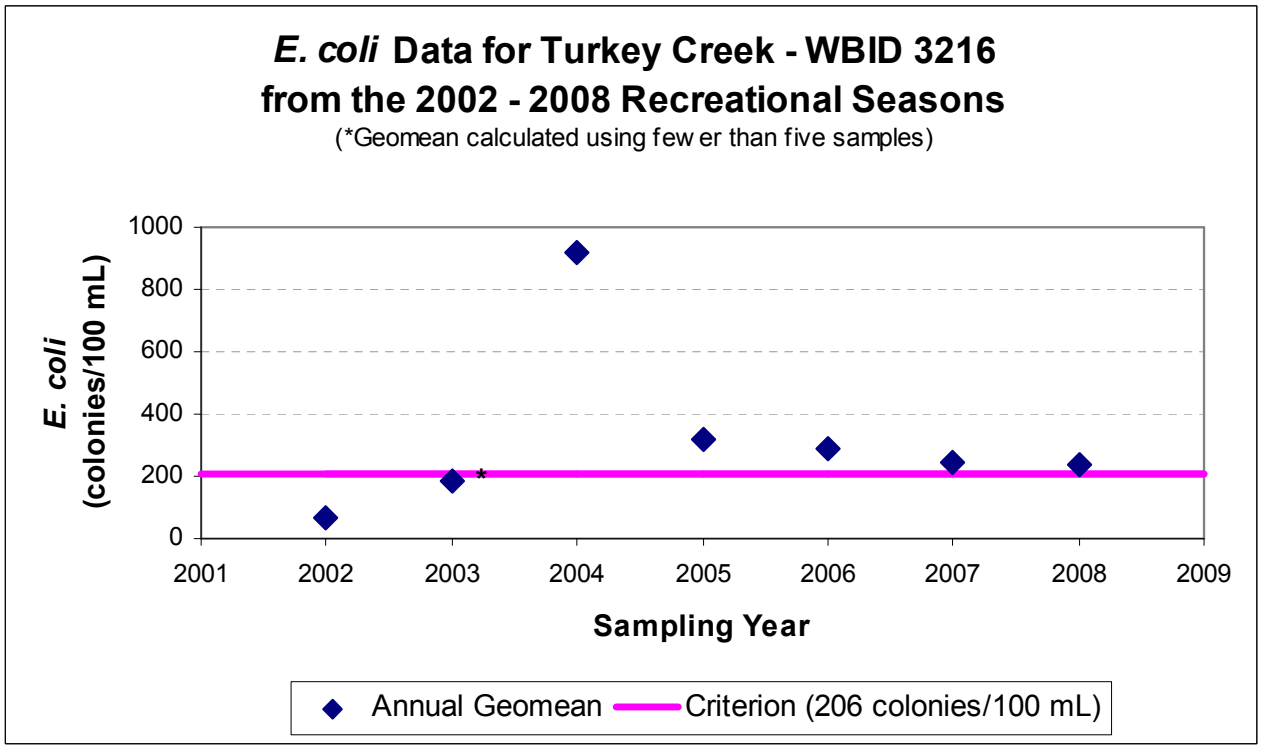
[1] Hudault S, Guignot J, Servin AL (July 2001). "*Escherichia coli* strains colonising the gastrointestinal tract protect germfree mice against *Salmonella typhimurium* infection". *Gut* **49** (1): 47–55

[2] Reid G, Howard J, Gan BS (September 2001). "Can bacterial interference prevent infection?". *Trends Microbiol.* **9** (9): 424–8.



Note: The geometric mean of these data for 2007 on this segment (WBID 3217) was 206 col/100 mL

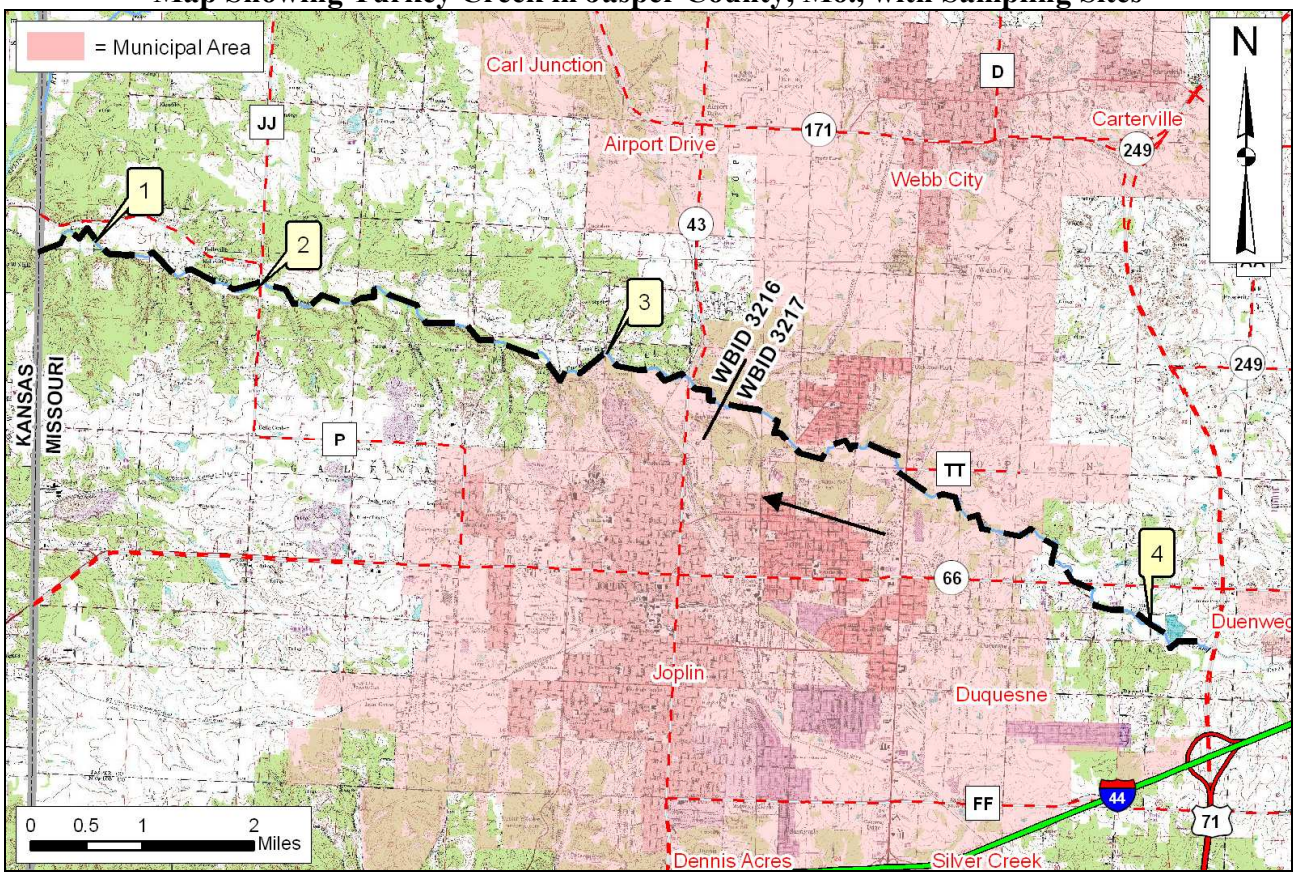
Figure 1



Note: Geomean = geometric mean

Figure 2

Map Showing Turkey Creek in Jasper County, Mo., with Sampling Sites



Sample Sites

1 -- Turkey Cr. south of Hwy P @ N. Fox Bluff Lane
2 -- Turkey Cr. @ Hwy P, 3.6 miles below Lone Elm Hollow
3 -- Turkey Cr. @ Lone Elm Hollow Road
4 -- Turkey Cr. south of Rt. 66 @ Kenser Road

For more information call or write:
Missouri Department of Natural Resources
Water Protection Program
P.O. Box 176, Jefferson City, MO 65102-0176
1-800-361-4827 or 573-751-1300 office
573-522-9920 fax
Program Home Page: www.dnr.mo.gov/env/wpp/index.html